

T&E COMMITTEE #1
July 19, 2011

MEMORANDUM

July 15, 2011

TO: Transportation, Infrastructure, Energy and Environment Committee

FROM: Glenn Orlin, ^{GO}Deputy Council Staff Director

SUBJECT: Facility planning review—Bradley Boulevard Bikeway

The Council programmed \$1,010,000 under the Facility Planning—Transportation project for the Department of Transportation (DOT) for the planning of a bikeway along Bradley Boulevard (MD 191) for nearly one mile, from the edge of the Bethesda CBD—the Little Falls Parkway/Glenbrook Road intersection—to Wilson Lane (MD 188). DOT has completed Phase I of facility planning for this project—the feasibility study stage—for which \$338,000 had been appropriated: \$98,000 in staff charges and \$240,000 in consultant funding.

This worksession is the opportunity for Committee members and other interested Councilmembers to provide informal feedback to DOT as to whether to proceed to Phase II of facility planning—the detailed planning stage—that would produce the precise project scope and develop reliable estimates of cost and community and environmental impact—and if so, what should be studied. DOT could proceed to Phase II soon after this review; its programmed cost is \$672,000: \$192,000 in staff charges and \$480,000 in consultant costs. If the Phase II study goes forward according to the funding schedule in the current capital program, a Bradley Boulevard Bikeway Capital Improvements Program (CIP) project may be ready to be included in the Recommended FY15-20 CIP in early 2014.

Aruna Miller, DOT's facility planning manager, will brief the Committee on the Department's findings and recommendations; the executive summary of the Phase I prospectus is on ©1-8; a brief overview of the project's background, background and purpose are on ©1-3. The project would primarily provide better bike and walk access from the adjacent neighborhoods to the southern portion of the Bethesda CBD, Little Falls Park, the Bethesda Pool, and the Capital Crescent Trail. However, it would also address congestion at the Bradley Boulevard/Wilson Lane intersection, and frequent drainage problems along Bradley Boulevard.

David Anspacher of the Planning staff will summarize the Planning Board's views; the Board's letter is on ©9-10, and the Planning staff's packet is on ©11-31. Council staff will conclude with analysis and recommendations. After the Committee has explored the issues, it will be asked for its guidance to DOT, which subsequently will be transmitted in a memorandum from the Committee Chair to the DOT Director.

Background. According to the Countywide Bikeways Functional Master Plan (2005), Bradley Boulevard ultimately is to have a shared use path (hiker-biker trail) and be wide enough to be a signed shared roadway (i.e., wide enough lanes to safely accommodate both motor vehicles and bikes) between Wisconsin Avenue to Persimmon Tree Road in Potomac. Bradley Boulevard has generally a 100'-wide right-of-way, because it was once planned to be a 4-lane arterial—the vestige of that plan is its 4-lane bridge over the Capital Beltway that was constructed 50 years ago. (The planned roadway was reduced in scope to 2 lanes in the 1990 Bethesda-Chevy Chase Master Plan; that plan also first called for a bike path.) Therefore, there is significant room on the north side of the right-of-way for a shared use path.

DOT examined several options in the first phase of facility planning, and it recommends carrying forward Alternative 4A into the second phase. The typical cross-section is pictured on ©20 and includes the following elements from south to north:

- a 5'-wide sidewalk that would be flush to a new curb (Bradley Boulevard generally does not have curb-and-gutter in this section);
- a 1'-wide gutter pan;
- a 4'-wide bike-able shoulder for eastbound bicyclists;
- an 11'-wide eastbound travel lane;
- an 11'-wide westbound travel lane;
- a 4'-wide bike-able shoulder for westbound bicyclists;
- a drainage swale of varying width to handle onsite stormwater management, within which utility poles would sit; and
- an 8'-wide shared use path.

In addition, Alternative 4A would include an additional 11'-wide lane in each direction for left turns onto Wilson Lane.

Any cost estimate at this stage of planning can only be very general. DOT has provided a cost estimate for Alternative 4A in the range of \$7-9 million, in FY12 dollars.

Even with the ample right-of-way here, however, there are two concerns that constrain what can be built. One constraint is the new requirement that stormwater must be managed in the right-of-way itself, not carried off in a storm sewer to an offsite location. This means that sufficient land must be made available to absorb runoff, and that impervious pavement, which generates runoff, should be minimized. The second constraint is the fact that, although the right-of-way is State property, for decades residents have planted trees and bushes there that provide much of the landscaping that serve as their front-yard foliage. The degree to which this foliage can be spared will mitigate some of the opposition to the project from these abutting residents.

The Planning Board reviewed DOT's prospectus on July 7 and concurs with DOT that Alternative 4A should be further fleshed out in the second phase of facility planning, with several additional recommendations. Council staff concurs that Alternative 4A should be carried forward with some, but not all, of the Planning Board's recommendations. Each of the Planning Board's recommendations is discussed below:

1. *Consider widening the 4'-wide bike-able shoulders to standard 5'-wide bike lanes, with appropriate marking.* Council staff disagrees. In just the past couple of weeks, the State Highway Administration has promulgated new standards that allow for bike lanes to be designated if they are 4' in width and if the roadway has a posted speed limit equal to or less than 35 mph (©32-33). Bradley Boulevard has a posted limit of 30 mph. The additional 2' would be better served on the shared use path (see the next recommendation).

2. *Consider setting the width of the shared use path at 10', reducing to 8' only at pinch points.* Council staff concurs. Shared use paths in the County currently range from 8-12' in width. The American Association of State Highway and Transportation Officials (AASHTO) and the Countywide Bikeways Plan each recommend a pavement width of at least 10'. The Countywide Bikeway Plan also notes that "Widths less than 10 feet may be acceptable where right-of-way is limited or for locations with severe site constraints" (©34). This means that the path's width could be reduced to 8' to help avoid a tree or utility pole. Although building a 10'-wide path would increase impervious surface slightly, it is enough of a difference to the riding experience and safety for it to be warranted.

3. *Prohibit parking on Bradley Boulevard in this segment to facilitate safe on-road biking.* Council staff concurs. There is ample opportunity for parking on side streets. Mr. John Wetmore, who lives in the neighborhood, testified at the Planning Board's public forum that several of those parking on Bradley Boulevard, especially between Glenbrook and Goldsboro Roads, are commuters to Bethesda who have found a free place to park.

4. *Consider adding a left-turn lane in each direction on the Wilson Lane approaches to Bradley Boulevard.* Council staff concurs. Peggy Dennis of the Montgomery County Civic Federation testified at the Planning Board's forum that the same problem of turning traffic backing up through traffic at this intersection occurs not only on the Bradley Boulevard approaches, but on the Wilson Lane approaches, too. Widening all the approaches is called for in the master plan: the 1990 B-CC Master Plan states that delays at this intersection "could be reduced by widening the approaches to two lanes so that *a lane on each approach could be used for left-turn movements*" (p. 121, *emphasis mine*).

The Critical Lane Volume standard for the Bethesda-Chevy Chase Policy Area is 1,600 CLV. The current intersection operates at Level of Service F in both peak hours: 1,629 CLV in the morning and 1,717 CLV in the evening. If the left-turn lanes on Bradley Boulevard were in place today, the intersection would operate at 1,403 CLV in the morning peak (Level of Service D) and 1,532 CLV in the evening peak (Level of Service E), both of which would be within the standard. However, with even a modest increase in traffic growth over time, the congestion level will exceed the standard in the evening peak within a few years. Adding left-turn lanes on the Wilson Lane approaches would add sufficient capacity to maintain congestion levels within the standard for the foreseeable future.

5. *Provide a minimum 6'-wide buffer between the sidewalk and the new curb on the south side.* Council staff disagrees. Normally some type of buffer is desirable. In this case, however, there would already be a 5' gap between the sidewalk and the eastbound motor vehicle lane. Providing a 6'-wide buffer would require pushing the entire cross-section to the north by 6', with larger impacts on the foliage buffer.

6. *Add pavement to several driveways to allow residents to more safely turn around rather than back into Bradley Boulevard.* Council staff disagrees. The speeds on Bradley Boulevard are not so high as to make backing up into it a serious problem. Increasing paving for turnarounds will add cost and, more significantly, more impervious surface, increasing the runoff problem.

7. *Minimize the number of trees taken, carefully locate stormwater management facilities, and consider using the Filterra bioretention system.* Council staff concurs. Planning staff notes that Filterra is a State-approved device that removes pollutants, achieving the purpose of catch basins in less space.

8. *Use medians where possible for stormwater management.* Council staff disagrees. Even if the median were no wider than the drainage swale shown in DOT's Alternative 4A, the addition of inside curbs and shy area between the travel lanes and this median would push the cross-section a few feet further north.

Summary. Council staff recommends carrying Alternative 4A into the second phase of facility planning, with the following additional guidance:

- **Consider setting the width of the shared use path at 10', reducing to 8' only at pinch points.**
- **Prohibit parking on Bradley Boulevard in this segment to facilitate safe on-road biking.**
- **Consider adding a left-turn lane in each direction on the Wilson Lane approaches to Bradley Boulevard.**
- **Minimize the number of trees taken, carefully locate stormwater management facilities, and consider using the Filterra bioretention system.**

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Executive Summary

A. Introduction

The Montgomery County Department of Transportation (MCDOT) has completed a Phase I Facility Planning Study to evaluate the need for sidewalks, master planned bicycle facilities and traffic safety improvements along Bradley Boulevard (MD 191) between Wilson Lane (MD 188) and Goldsboro Road (MD 614). This Prospectus concludes the Phase I Study and will be used by the Director of MCDOT to determine whether the project should proceed to a Phase II Facility Planning Study.

B. Project Background and Description

Bradley Boulevard is a two-lane arterial roadway with an Average Daily Traffic (ADT) of 15,000 vehicles and a posted speed limit of 30 miles per hour. The public right of way is 100 feet wide.

The study area is located in a single-family residential community in Bethesda, Maryland. The Bethesda Central Business District (CBD) is located 1 mile to the east from the study area. Bradley Boulevard intersects the Capital Crescent Trail just east of the study area and is in close proximity to the North Bethesda Trail (also known as the Bethesda Trolley Trail). There are also on-road bike lanes on Fairfax Road and Little Falls Parkway just east of the study area. Nearby destinations for pedestrians and bicyclists in the study area include Chabad of BCC, the Bethesda Community School, Radnor Center, Bradley Hills Elementary School, Thomas W. Pyle Middle School, Walt Whitman High School and a Safeway grocery store. There are three Metro stations within 2 miles of the study area: Bethesda, Medical Center, and Friendship Heights. Montgomery County Transit's Ride-On Bus Route 36 provides weekday service along Bradley Boulevard to connect to the Bethesda Metro station.

This section of Bradley Boulevard is discussed in the 1990 *Approved and Adopted Bethesda-Chevy Chase Master Plan* and the 2005 *Countywide Bikeways Functional Master Plan*. According to the master plans, dual bikeways (shared use path and on-road bikeable shoulders) are proposed on Bradley Boulevard from Persimmon Tree Road to the north to Wisconsin Avenue to the south of which this project area is a small part of this length.

The east end of the study area was extended from Goldsboro Road to Glenbrook Road after the first public meeting and newsletter. There were many public comments that Glenbrook Road is the more logical project terminus due to its connection to the Capital Crescent Trail.

C. Project Purpose

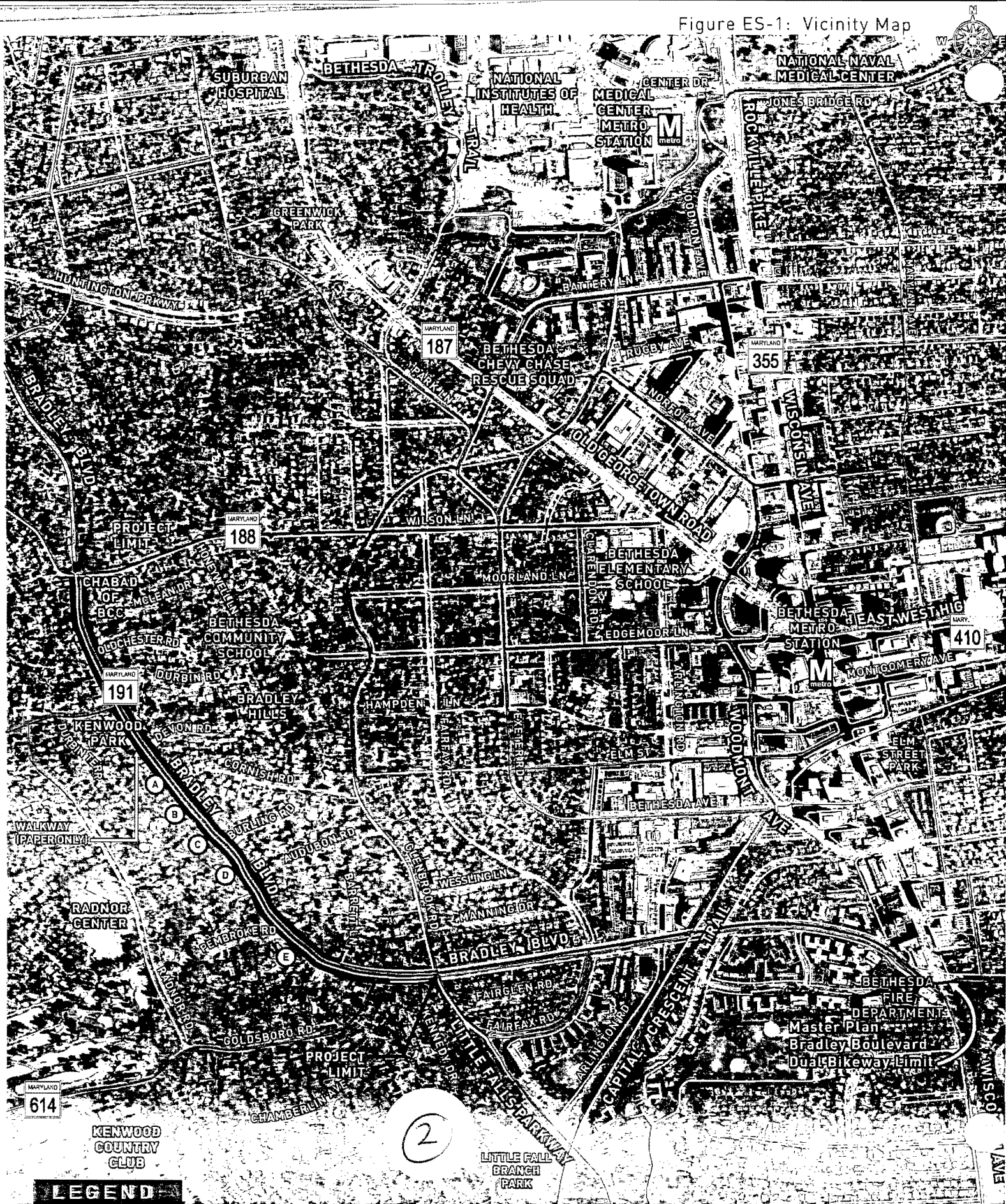
The purpose of Bradley Boulevard Improvements Project is to:

- Comply with the 1990 *Approved and Adopted Bethesda-Chevy Chase Master Plan* and the 2005 *Countywide Bikeways Functional Master Plan*
- Promote and enhance bicycling and continuous pedestrian facilities
- Encourage multi-modal transportation usage to work centers, places of worship, parks, trails, schools, shopping areas, transit stops, and homes
- Improve access to transit stops and the Medical Center, Bethesda, and Friendship Heights Metrorail stations



BRADLEY BOULEVARD (MD 191) IMPROVEMENTS PROJECT

Figure ES-1: Vicinity Map



A Beam Court
 B Vernon Place
 C Brite Drive
 D Burling Court
 E Pembroke Terrace

Existing Sidewalks
 Existing Shared Roadway/Bike Lanes
 Planned Shared Use Path
 Planned Shared Roadway/Bike Lanes
 Potential Sidewalk Connections
 Bethesda Central Business District

BRADLEY BOULEVARD (MD 191) IMPROVEMENTS PROJECT

- Promote a safe environment for pedestrians and bicyclists
- Improve observed existing traffic patterns and operations

D. Project Need

The need for the Bradley Boulevard Improvements Project is to:

- Improve access to major destinations along and beyond the study area as recommended in the 1990 Approved and Adopted Bethesda-Chevy Chase Master Plan and the 2005 Countywide Bikeways Functional Master Plan
- Address existing sidewalk and bicycle facility disconnects
- Provide safe facilities to address pedestrian and bicycle demand
- Improve observed existing traffic patterns and operations to address critical safety and capacity issues

E. Alternates Evaluated

Six alternates were developed and evaluated based on the Master Plans, the project's purpose and need, the traffic study, safety, and the environmental assessment.

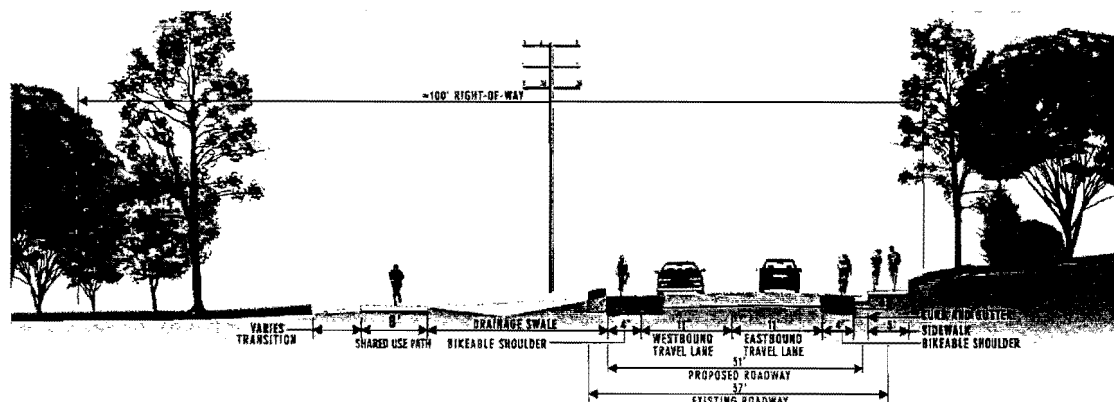
- Alternate 1 – No-Build
- Alternate 2 – Master Plan
- Alternate 3 – Enhanced Master Plan
- Alternate 4A – 8' Shared Use Path North Side and Sidewalk South Side with Bikeable Shoulders (**Recommended Alternate**)
- Alternate 4B – Sidewalk North and South Sides with Bikeable Shoulders
- Alternate 4C – Sidewalk North Side Only with Bikeable Shoulders

All build alternates include drainage improvements and the addition of left turn lanes along Bradley Boulevard at Wilson Lane.

F. Recommended Alternate

The team recommended alternate is Alternate 4A – 8' Shared Use Path North Side and Sidewalk South Side with Bikeable Shoulders is a minimized version of the recommendations from the 1990 *Approved and Adopted Bethesda-Chevy Chase Master Plan* and the 2005 *Countywide Bikeways Functional Master Plan*.

Figure ES-2. Alternate 4A – 8' Shared Use Path North Side and Sidewalk South Side with Bikeable Shoulders Typical Section Looking East



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BRADLEY BOULEVARD (MD 191) IMPROVEMENTS PROJECT**BRADLEY BOULEVARD (MD 191) IMPROVEMENTS PROJECT
SUMMARY TABLE****PROJECT STUDY INFORMATION**

Name of Project and CIP #	Bradley Boulevard (MD 191) Improvements Project CIP #509337
Study Phase	Facility Planning, Phase I
Transportation Category	Pedestrian and Bicycle Facilities
Study Performed by	Montgomery County Department of Transportation (MCDOT), Division of Transportation Engineering
Phase I Project Manager	Patricia Shepherd, (240) 777-7231
Phase I Consultant	Whitman, Requardt and Associates, LLP Jim Guinther, (443) 224-1583
Road Name	Bradley Boulevard (MD 191)
Project Limits	From Wilson Lane (MD 188) to Glenbrook Road
Project Length	Approximately 1 mile
Functional Classification of Roadway	Arterial (A-39)

EXISTING CONDITIONS

Number of Lanes	2 from Wilson Lane to Goldsboro Road, 6 from Goldsboro Road to Glenbrook Road
Typical Lane Width	11 to 13 feet
Typical Shoulder Width	2 to 12 feet
Average Daily Traffic (ADT)	15,000
Bus Stops	17 Montgomery County Ride-On Bus Stops (Route 36) <ul style="list-style-type: none">• 8 westbound• 9 eastbound
Metro Stations within 2 Miles	Bethesda, Medical Center, and Friendship Heights
Posted Speed Limit	30 miles per hour
Adjacent Communities	<ul style="list-style-type: none">• Bradley Hills• Kenwood Park
Signalized Intersections	<ul style="list-style-type: none">• Bradley Boulevard / Wilson Lane• Bradley Boulevard / Goldsboro Road• Bradley Boulevard / Glenbrook Road

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BRADLEY BOULEVARD (MD 191) IMPROVEMENTS PROJECT

BRADLEY BOULEVARD (MD 191) IMPROVEMENTS PROJECT SUMMARY TABLE EXISTING CONDITIONS

Stop-Controlled Intersections	Minor Streets stop-controlled at Bradley Boulevard <ul style="list-style-type: none"> • McLean Drive • Oldchester Road • Durbin Road • Devon Road • Beam Court • Cornish Road • Vernon Place • Brite Drive • Burling Road • Burling Court • Audubon Road • Pembroke Road • Pembroke Terrace • Barrett Lane • Kennedy Drive
Homes Adjacent to Bradley Boulevard	81 from Wilson Lane to Goldsboro Road 4 from Goldsboro Road to Glenbrook Road
Homes with Driveway Access	56 from Wilson Lane to Goldsboro Road 4 from Goldsboro Road to Glenbrook Road
Schools	2 (Bethesda Community School and Radnor Center)
Places of Worship	1 (Chabad-Lubavitch Center of Bethesda-Chevy Chase)
Parks	N/A
Other Places of Interest	Bethesda Central Business District, Capital Crescent Trail
Portion with Closed/Open Section	Open Section: From Wilson Lane to Barrett Lane Closed Section: From Barrett Lane to Glenbrook Road
Portion with Sidewalk	Along north side of roadway from Barrett Lane to Glenbrook Road Along south side of roadway from Goldsboro Road to Glenbrook Road
Right-of-Way Width	100'
Natural Environmental Resources	<ul style="list-style-type: none"> • 29 specimen trees (trees greater than 30 inches in diameter) • 25 significant trees (trees 24-30 inches in diameter)
CRASH HISTORY	
2003 to 2007 Additional information on the crash history of this section of Bradley Boulevard can be found in the Bradley Boulevard Traffic Study in Appendix F.	<ul style="list-style-type: none"> • 62 total crashes • 18 crashes at Bradley Boulevard / Wilson Lane • 19 crashes at Bradley Boulevard / Goldsboro Road • No fatalities • 30 crashes with injuries • 3 crashes involving a bicyclist

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BRADLEY BOULEVARD (MD 191) IMPROVEMENTS PROJECT

BRADLEY BOULEVARD (MD 191) IMPROVEMENTS PROJECT SUMMARY TABLE

FACILITY PLANNING, PHASE I SUMMARY

Transportation Category	Pedestrian and Bicycle Facilities
Referenced Master Plans	<ul style="list-style-type: none"> • 1990 Approved and Adopted Bethesda-Chevy Chase Master Plan • 2005 Countywide Bikeways Functional Master Plan
Purpose	<ul style="list-style-type: none"> • Comply with the 1990 Approved and Adopted Bethesda-Chevy Chase Master Plan and the 2005 Countywide Bikeways Functional Master Plan • Promote and enhance bicycling and continuous pedestrian facilities • Encourage multi-modal transportation usage to work centers, places of worship, parks, trails, schools, shopping areas, transit stops, and homes • Improve access to transit stops and the Medical Center, Bethesda, and Friendship Heights Metrorail stations • Promote a safe environment for pedestrians and bicyclists • Improve observed existing traffic patterns and operations
Need	<ul style="list-style-type: none"> • Improve access to major destinations along and beyond the study area as recommended in the 1990 Approved and Adopted Bethesda-Chevy Chase Master Plan and the 2005 Countywide Bikeways Functional Master Plan • Address existing sidewalk and bicycle facility disconnects • Provide safe facilities to address pedestrian and bicycle demand • Improve observed existing traffic patterns and operations to address critical safety and capacity issues
Project Start Date	March 2009
Project Prospectus Completion Date	May 2011
Alternates Evaluated	<ul style="list-style-type: none"> • Alternate 1 – No-Build • Alternate 2 – Master Plan • Alternate 3 – Enhanced Master Plan • Alternate 4A – 8' Shared Use Path North Side and Sidewalk South Side with Bikeable Shoulders • Alternate 4B – Sidewalk North and South Sides with Bikeable Shoulders • Alternate 4C – Sidewalk North Side Only with Bikeable Shoulders
Recommended Alternate	The recommended alternate is Alternate 4A – 8' Shared Use Path North Side and Sidewalk South Side with Bikeable Shoulders. Alternate 4A is a minimized version of the recommendations from the 1990 Approved and Adopted Bethesda-Chevy Chase Master Plan and the 2005 Countywide Bikeways Functional Master Plan. The recommended alternate includes drainage improvements and the addition of left turn lanes along Bradley Boulevard at Wilson Lane.

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BRADLEY BOULEVARD (MD 191) IMPROVEMENTS PROJECT

BRADLEY BOULEVARD (MD 191) IMPROVEMENTS PROJECT SUMMARY TABLE

FACILITY PLANNING, PHASE I SUMMARY

Recommended Alternate Impacts	<p><u>Property Impacts</u></p> <ul style="list-style-type: none"> • 0 acres of right-of-way • Between ½ and 1 acres of grading easement • No building impacts <p><u>Natural Environmental Impacts</u></p> <ul style="list-style-type: none"> • 3-4 specimen trees • 7-12 significant trees • 76-138 smaller trees • 0.7 acres of additional impervious <p><u>Utility Impacts</u></p> <ul style="list-style-type: none"> • 7 utility poles • Minor surface feature adjustments for water, sewer, and gas <p><u>Parking Impacts</u></p> <ul style="list-style-type: none"> • Infrequent parking on the shoulder of Bradley Boulevard that occurs today will be impacted • 20 on-street parking spaces along westbound Bradley Boulevard between Barrett Lane and Glenbrook Road will be impacted
PUBLIC OUTREACH	
Public Meetings	<ul style="list-style-type: none"> • October 27, 2009 • November 10, 2010
Newsletters Distributed	<ul style="list-style-type: none"> • October 2009 • October 2010 • March 2011
Mailing List	<ul style="list-style-type: none"> • 155 residents • 36 organizations or public officials
OTHER	
Unresolved Issues	<ul style="list-style-type: none"> • During Phase II the study team will consider bus stop design, ADA compliance, and lighting for the project. The study team will also review the shared use path at side roads to develop the safest crossing locations. The study team will also consider including a buffer between the roadway and sidewalk on the south side wherever possible without impacting right-of-way. • The study team received many public comments concerning the aesthetics of the drainage swale and bioswales. Efforts will be made during Phase II design to minimize the size of the drainage swales and bioswales while still meeting the project's regulatory stormwater management requirements.



BRADLEY BOULEVARD (MD 191) IMPROVEMENTS PROJECT**BRADLEY BOULEVARD (MD 191) IMPROVEMENTS PROJECT
SUMMARY TABLE
OTHER**

Unresolved Issues	<ul style="list-style-type: none">• The study team received many public comments concerning the safety of pedestrians crossing Bradley Boulevard between the two signalized intersections. The study team will investigate additional crosswalk locations or enhanced crosswalks along Bradley Boulevard to enhance the project. Any changes or additions to crosswalks will require SHA approval. <p>The study team received many public comments throughout the planning study, describing the community's desire to maintain the existing character and landscape of the neighborhood. Efforts will be made during Phase II design to further minimize tree impacts to the maximum extent practical including the following practices.</p> <ul style="list-style-type: none">• Pervious Pavement – The study team will investigate the soil conditions to determine whether the use of pervious pavement is recommended. If it is recommended, the study team will coordinate with DPS/MDE to use pervious pavement while reducing the use of other stormwater management measures such as bioswales to control water runoff. The reduction in the use of bioswales will reduce the project's disturbance and in turn have the added benefit of helping to reduce tree impacts.• Shared Use Path Alignment – There may be opportunities to optimize the shared use path alignment for further impact reduction. The study team will adjust the alignment of the shared use path to minimize tree impacts to the maximum extent practical while still meeting the project's design criteria.• Tree Save Methods – The study team will employ tree save methods for certain trees that have less than 50% of their root zone impacted by the proposed construction. During design, options shall be explored to bring new technologies and innovation to the design to help preserve trees. Some methods that may be explored include pruning the affected roots and aerating/fertilizing the area to reduce stress on the root zone. Other methods may include raising the path using a non compactable stone layer over the root zone and topping the stone with a concrete path built on top instead of an asphalt path which requires compaction.
Unique Features	None
Planning Board Briefing Date/Comments	TBD
Montgomery County Council's Transportation and Environment Committee (T&E) Briefing Date/Comments	TBD



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MONTGOMERY COUNTY PLANNING BOARD

THE MARYLAND-NATIONAL CAPITAL PARK AND PLANNING COMMISSION

OFFICE OF THE CHAIRMAN

July 8, 2011

Mr. Arthur Holmes, Jr., Director
Montgomery County Department of Transportation
101 Monroe Street, 10th floor
Rockville, Maryland 20850

RE: Bradley Blvd Improvements Project Phase I Facility Planning Study
From Glenbrook Road to Wilson Lane

Dear Mr. Holmes:

At our regularly scheduled meeting on July 7, 2011, the Planning Board reviewed the Project Prospectus for the Bradley Blvd Improvements Project and made the following recommendations:

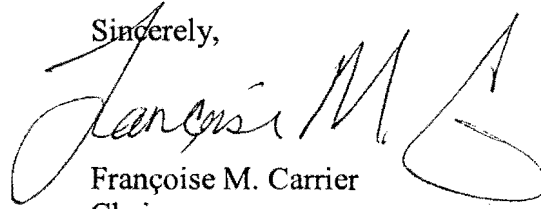
1. The Bradley Boulevard Improvements Study should proceed to Phase II of the facility planning process to develop a detailed design for the completion of the Recommended Alternative (4A).
2. Consider widening the proposed four-foot-wide bikeable shoulder to a full five-foot-wide marked bike lane and consider widening the proposed eight-foot-wide shared use path to ten feet. We believe that at least one of these bike facilities must be at the standard width, and if there is a constraint where the shared use path must be narrower than ten feet, that should be the exception rather than the rule.
3. Prohibit parking on Bradley Boulevard between Glenbrook Road and Wilson Lane to facilitate safe bicycle use.
4. If the bikeable shoulders are widened to five feet, mark them with a bike lane stencil.
5. Consider adding left turn lanes on Wilson Lane at Bradley Boulevard to decrease traffic congestion and improve safety.
6. Provide a six-foot buffer (min.) between the sidewalk and the curb on the south side of Bradley Boulevard where feasible, possibly by shifting the roadway to the north where right-of-way is available.

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7. Ensure that adequate sight distance exists at each of the driveway crossings of the proposed shared use path. Where existing driveways do not allow residents to turn around on their property, consider providing additional driveway pavement to allow them to exit their driveways front first, if desired by property owners.
8. Minimize the number of trees required to be removed for this project, taking particular care to reduce the impact to trees on private property. The type of proposed stormwater management facilities should be carefully located and selected, and the use of a Filterra bioretention system should be considered.
9. Use medians where possible for additional stormwater management.
10. We concur with your decision to examine the following items in greater detail during Phase II of this Facility Planning Study and look forward to their resolution at the time of Mandatory Referral:
 - a. Lighting at intersections and mid-block crossings,
 - b. Setback of shared use paths at intersections,
 - c. ADA access to bus stops and at intersections,
 - d. Additional striped crosswalks, and
 - e. Use of porous pavement for the sidewalks and shared use path.

Thank you for your attention to this matter. If you have any questions or comments concerning our review, please call David Anspacher of our staff at 301-495-2191.

Sincerely,



Françoise M. Carrier
Chair



MONTGOMERY COUNTY PLANNING DEPARTMENT

THE MARYLAND-NATIONAL CAPITAL PARK AND PLANNING COMMISSION

MCPB

Item #8

July 7, 2011

MEMORANDUM

DATE: June 30, 2011

TO: Montgomery County Planning Board

VIA: Mary Dolan, Acting Chief *MD*
Functional Planning and Policy Division

Rose Krasnow, Chief *RK*
Area 1 Division

Larry Cole, Master Planner *LC*
Functional Planning and Policy Division

FROM: David Ansbacher, Senior Planner (301-495-2191) *DA*
Functional Planning and Policy Division

DISCUSSION: Bradley Boulevard Improvements Project
From Glenbrook Road to Wilson Lane
Phase I Facility Planning Study
Project Prospectus Recommendations

APPLICANT: Montgomery County Department of Transportation

EXECUTIVE SUMMARY:

Staff will brief the Board on the draft Project Prospectus for the Bradley Boulevard Improvements project (see Attachment A: Vicinity Map) and solicit your comments, which will be considered in MCDOT's preparation of the final document to be submitted to the County Council.

MCDOT's recommended alternative includes bikeable shoulders along Bradley Boulevard between Glenbrook Road and Wilson Lane, a sidewalk on the south side, a drainage swale and a shared-use path on the north side, and left turn lanes on Bradley Boulevard at Wilson Lane.

The majority of area residents appear to be in favor of constructing this project, but a sizeable minority have concerns or are opposed; many of the latter are residents of Bradley Boulevard.

We believe that MCDOT has adequately addressed the issues raised and we support the recommended alternative with the comments recommended below.



RECOMMENDATIONS: Transmit the following comments to the Montgomery County Department of Transportation:

1. The Bradley Boulevard Improvements Study should proceed to Phase II of the facility planning process to develop a detailed design for the completion of the Recommended Alternative (4A).
2. Provide a 6 ft buffer (min.) between the sidewalk and the curb on the south side of Bradley Boulevard by shifting the roadway to the north where right-of-way is available.
3. Ensure that adequate sight distance exists at each of the driveway crossings of the proposed shared use path. Where existing driveways do not allow residents to turn around on their property, consider providing additional driveway pavement to allow them to exit their driveways front first, if desired by property owners.
4. Minimize the number of trees required to be removed for this project, taking particular care to reduce the impact to trees on private property. The type of proposed stormwater management facilities should be carefully located and selected, and the use of a Filterra bioretention system should be considered.
5. Use medians where possible for additional stormwater management.
6. We concur in your decision to examine the following items in greater detail during Phase II of this Facility Planning Study and look forward to their resolution at the time of Mandatory Referral:
 - a. Lighting at intersections and mid-block crossings,
 - b. Setback of shared-use paths at intersections,
 - c. ADA access to bus stops and at intersections,
 - d. Additional striped crosswalks, and
 - e. Use of porous pavement for the sidewalks and shared use path

PREVIOUS BOARD ACTIONS: None

SITE DESCRIPTION

The project study area includes approximately one mile of Bradley Boulevard, between Glenbrook Road and Wilson Lane. Bradley Boulevard is a six-lane major highway from Glenbrook Road to Goldsboro Road and a two-lane arterial road from Goldsboro Road to Wilson Lane. Average Daily Traffic (ADT) is approximately 15,000 vehicles. The posted speed limit is 30 mph and the public right-of-way is 100 ft wide.

The study area is approximately one mile to the west of the Bethesda CBD and is largely characterized by single-family residences. Community facilities directly adjacent to Bradley Boulevard include the Radnor Center, Bethesda Community School (a private preschool and kindergarten), and the Chabad Center of BCC.

Ride On Route 36 provides bus service along Bradley Boulevard between Potomac and the Bethesda CBD. There are 17 bus stops in the study area with an average of 88 boardings and alightings per day.

There are three signalized intersections on Bradley Boulevard in the study area: Glenbrook Road, Goldsboro Road, and Wilson Lane.

STUDY DESCRIPTION

The purpose of this project is to improve pedestrian and bicycle safety and connectivity on Bradley Boulevard between Glenbrook Road and Wilson Lane, improve access to transit, and improve traffic operations. Currently, Bradley Boulevard has bikeable shoulders of varying width and deterioration that are used by experienced cyclists, but there are no off-road facilities for less-experienced cyclists.

Over the entire one-mile length of the project, sidewalks exist for only 800 ft on the north side and 500 ft of the south side at the east end of the study area. For most of the project length, pedestrians must walk in the shoulder of this fairly busy road.

The Phase I study conducted by MCDOT evaluated six alternatives, including a no-build alternative (Attachments B-1 thru B-6 show the typical sections for each alternative). Each build alternative is composed of two vehicular travel lanes, a pedestrian/bicycle element, and stormwater management:

- Alternative 1 is the No-Build alternative and proposes no construction, leaving inadequate facilities for pedestrians and less-experienced cyclists.
- Alternative 2 includes a 10 ft shared use path on the north side and 4 ft bikeable shoulders on both sides. This alternative would accommodate both experienced and less-experienced cyclists and provide improved access for pedestrians. However, residents living on the south side and bus patrons traveling in the direction of Wisconsin Ave would have to walk in the shoulder or cross the street to use the proposed shared use path.
- Alternative 3 includes a 12 ft shared use path on the north side, 6 ft bikeable shoulders, and a 5 ft sidewalk on the south side. The widths of the shared use path and bikeable shoulders are at the high end of design standards and would have the greatest impacts on the surrounding area.
- Alternative 4A is the **Recommended Alternative**. It includes an 8 ft shared use path on the north side, 4 ft bikeable shoulders, and a 5 ft sidewalk on the south side. The widths of the shared use path and the bikeable shoulders are at the low end of the design standards.
- Alternative 4B includes 5 ft sidewalks on both sides of the road and 4 ft bikeable shoulders. It does not include an off-road shared use path.

- Alternative 4C includes bikeable shoulders varying from 4 ft to 12 ft and a 5 ft sidewalk on the north side. It does not include a sidewalk on the south side or an off-road shared use path.

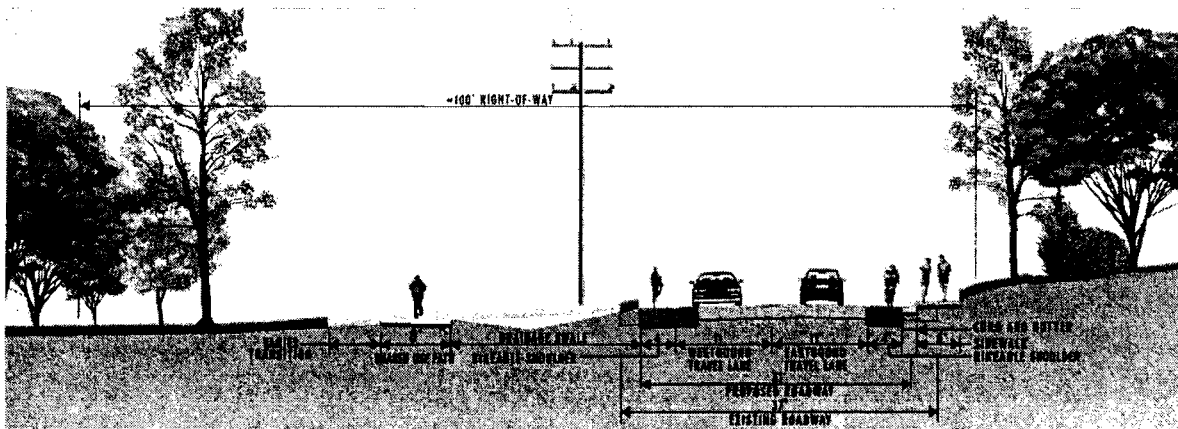
Currently, none of the approaches to the intersection of Bradley Boulevard and Wilson Lane have left-turn bays. This increases delay and queuing for thru and right turning vehicles and creates a potential safety hazard for cyclists riding in the shoulder, as motorists use the shoulder to bypass left-turning vehicles. The Phase I study proposes left turn bays from Bradley Boulevard to Wilson Lane in both directions for each of the build alternatives.

The project study area does not currently have a stormwater management system. This results in standing water on the roadway during rain events, which is a safety problem for motorists and bicyclists and causes deterioration of the roadway and shoulders. Each of the build alternatives includes stormwater management by means of a drainage swale on the north side of Bradley Boulevard between the roadway and the path or sidewalk, including some stormwater management bioswales intended to filter pollutants and sediments from stormwater runoff before it enters the groundwater.

Alternatives 2 and 4C leave an open section for drainage along the south side of the roadway. Alternatives 3, 4A, and 4B add curb and gutter along the south side between the roadway and the sidewalk. All drainage on the south side would be collected in inlets and discharged to the swale on the north side.

A typical section of the Recommended Alternative 4A is shown in Figure 1 below. Three plan views are shown in Attachments C-1 thru C-3, and a rendering is shown in Attachment D comparing the existing condition to the Recommended Alternative.

Figure 1: Cross Section for Recommended Alternative (4A)



MASTER PLAN CONSISTENCY

The following recommendations in the approved and adopted 1990 Bethesda Chevy Chase Master Plan and the 2005 Countywide Bikeways Functional Master Plan should be considered in the evaluation of the Bradley Boulevard Improvements Project:

- The Countywide Bikeways Functional Master Plan recommends a Dual Bikeway (DB-4) on Bradley Boulevard from Wisconsin Ave to Persimmon Tree Road, including an off-road shared use path and an on-road signed shared roadway (p.35 and 44).
- An overarching goal of the Bethesda Chevy Chase Master Plan (p.97) is the "Expansion of the system of pedestrian paths and bikeways to link residential areas with public facilities, commercial areas, and transit services."
- The Bethesda Chevy Chase Master Plan also recommends the "expansion of pedestrian paths and bikeways to form a network linking residential neighborhood with public facilities" (p.102). Further, the Plan also recommends improving pedestrian safety along major highways and arterials, such as Bradley Boulevard (p.103).
- The Bethesda Chevy Chase Master Plan recommends improvements to the intersection of Bradley Boulevard and Wilson Lane to increase intersection capacity (p.118).

The No-Build Alternative is not consistent with these Master Plan recommendations, since they recommend an expansion of pedestrian and bicycle facilities, as well as traffic improvements. The build alternatives are all consistent to varying degrees but only Alternatives 3 and 4A fully meet the intent of these Master Plans, because they include pedestrian facilities on both sides of Bradley Boulevard as well as both on- and off-road bicycle facilities. Alternative 3 provides the best accommodation but has the greatest impacts. MCDOT selected Alternative 4A as the preferred alternative because it accomplishes the project objectives with lesser impacts.

STAFF ANALYSIS OF THE RECOMMENDED ALTERNATIVE

We concur with MCDOT's evaluation of the Bradley Boulevard study area, which found that there is a need for better pedestrian and bicycle safety and connectivity, to improve traffic flow, and to introduce stormwater management in the study area; and we concur with their selection of Alternative 4A as the preferred alternative.

Benefits of Recommended Alternative

The Recommended Alternative addresses the need for continuous pedestrian facilities on both sides of Bradley Boulevard, as well as a dual bikeway - both on-road and off-road bicycle facilities. These facilities would greatly increase pedestrian and bicyclist comfort and accommodation, serve bus stops and local destinations and community facilities, and enhance connections to the Bethesda CBD, the Capital Crescent Trail, and the Bethesda Metrorail station.

The proposed shared use path would serve pedestrians and less-experienced cyclists. More experienced cyclists will continue to travel along the bikeable shoulders, where they can travel at higher speeds. These shoulders will have a consistent width and will be less susceptible to deterioration.

A map of existing and proposed bikeways and trails in the vicinity is shown in Attachment E. The Capital Crescent Trail is located just east of the proposed Bradley Boulevard dual bikeway. In addition, on-road bike lanes are planned on Goldsboro Road (BL-1) and Wilson Lane (BL-3), and signed-shared roadways are planned on Glenbrook Road (SR-10) and Little Falls Parkway (SR-9). When fully implemented, these bikeways will comprise a robust network that enables cyclists of various skill levels to access local and regional destinations.

Providing left turn lanes on Bradley Boulevard at Wilson Lane in both directions would improve traffic flow and bicycle safety. Thru and right-turning motorists would no longer need to travel in the bikeable shoulder to bypass left turning vehicles.

The Recommended Alternative includes stormwater management on the north side of Bradley Boulevard by means of a drainage swale that runs the length of the project between the roadway and the shared use path, and periodic stormwater management bioswales. Curb and gutter would be installed along the south side between the roadway and the sidewalk. All drainage on the south side would be collected in inlets and discharged to the swale on the north side. This would reduce the deterioration of the pavement, thereby improving safety for on-road cyclists and motorists.

Impacts of Recommended Alternative

The Project Prospectus identifies environmental impacts of the Recommended Alternative, based on field reviews and readily available information from resource agencies. These preliminary assessments will be refined in Phase II when a Natural Resources Inventory/Forest Stand Delineation (NRI/FSD) is performed and more facility design details are developed. The environmental impacts identified in the Prospectus include 3-4 specimen trees (>30" diameter), 7-12 significant trees (24" to 30" diameter), and 76-138 smaller trees (<24" diameter), and 0.7 acres of additional impervious area.

The Project Prospectus states that no additional right-of-way is needed and no buildings will be impacted. Grading easements will be required on between 0.5 and 1.0 acre of private property.

On-street parking does not exist for most of the project length but a limited number of spaces in front of five houses would be removed at the western project limit. No objections to the removal of on-street parking have been received. To the contrary, MCDOT has received a request to limit this parking to two-hours because of various concerns with its current daytime use.

No rare, threatened or endangered species are known to exist in the study area. MCDOT will need to document these impacts through submission of the NRI/FSD and a Forest Conservation Plan (FCP) during Phase II activities.

Additional Public Concerns

As noted below, two public meetings were held for this study. Public comments in opposition to the project have focused on several concerns:

- Character of Bradley Boulevard: Many citizens are concerned that the removal of trees along the corridor will diminish the character of Bradley Boulevard. MCDOT believes that the tree impacts noted above can be reduced during Phase II Facility Planning by employing tree save methods and redesigning the size of the drainage swales and bioswales.
- Conflicts at driveways: There are driveways to 27 residences on the north side of Bradley Boulevard in the study area where an additional conflict point would be created between cyclists using the shared use path and motor vehicles entering and exiting the driveways. Many residents commented that it is already difficult to enter and exit their driveways due to high traffic volumes and cyclists riding on the shoulders. They expressed concern that this will become even more difficult if they have to watch out for pedestrians and cyclists on the shared use path as well. We believe that while the shared use path will likely experience a moderate amount of use by cyclists during peak periods and on the weekends, there should be no significant increase in difficulty for residents to enter and exit their driveways.
- Existing demand does not warrant the public investment: Some citizens commented that there is little existing bicycle or pedestrian demand on Bradley Boulevard, and therefore the project is not a good use of public funds. This concern is somewhat at odds with the above comment that there are existing conflicts between motorists and bicyclists. In any event, existing use is a poor predictor of future demand when existing facilities require that all pedestrians and cyclists travel in deteriorating shoulders along a busy roadway. We believe that the proposed facilities will serve latent demand and are likely to result in greater walking and bicycling on Bradley Boulevard due to the proximity to local and regional destinations. These facilities would also provide better access to the bus stops along Bradley Boulevard, supporting the County's goal of increasing transit use.
- High speed bikeway: Some citizens have expressed the concern that the proposed shared use path will become a high-speed bikeway. However, cyclists that desire to travel at a high speed typically prefer to ride on the road where they encounter fewer obstacles and can therefore be expected to use the improved bikeable shoulders.
- Bikeway to nowhere: Several citizens expressed concern that the project would build a bikeway that does not connect to anything. However, this project is envisioned as the first phase of a future dual bikeway on Bradley Boulevard between Persimmon Tree Road and Wisconsin Ave. Additionally, this project would provide important connections to the Capital Crescent Trail (via Little Falls Parkway) and provide pedestrian connections to Bethesda CBD and the Bethesda Metro station, as shown on Attachment E.

- Left turn lanes will increase traffic and reduce gaps: As noted above, there are no left turn bays from Bradley Boulevard to Wilson Lane. This increases delay and queuing for thru and right turning vehicles and creates a safety hazard for cyclists riding in the shoulder, as motorists use the shoulder to bypass left-turning vehicles. Some citizens are concerned that adding left turn bays on Bradley Boulevard will increase traffic and reduce the gaps in traffic that enable motorists to enter and exit their driveways. While we are unable to determine the impact on traffic volumes, we agree that there will likely be fewer gaps in traffic.

RECOMMENDATIONS

To enhance the proposed project, staff recommends that MCDOT make the following changes:

Landscaped Buffer: To the extent possible, a minimum 6 ft buffer should be provided between the sidewalk and the curb on the south side of Bradley Boulevard by shifting the roadway to the north where right-of-way is available. This will accommodate street trees and improve pedestrian comfort. A six-foot-wide buffer is also the minimum needed to avoid adjusting the sidewalk vertically or horizontally at every ADA ramp and driveway, which would make travel for disabled persons more difficult.

Driveway Conflicts and Reduced Gaps: MCDOT should ensure that adequate sight distance exists at each of the driveway crossings of the proposed shared use path. Where existing driveways do not allow residents to turn around on their property, consider providing additional driveway pavement to allow them to exit their driveways front first, if desired by property owners.

Tree Impacts: The number of trees required to be removed or adversely affected by this project should be minimized, in part by carefully locating and selecting the type of proposed stormwater management facilities. There is some flexibility in the location of proposed stormwater management facilities that could facilitate minimizing the number of trees that would need to be removed. In addition, MCDOT should consider the use of a Filterra bioretention system in place of some of the proposed bioswales. Filterra is a Maryland Department of the Environment-approved device that removes the pollutants in stormwater. This device is a sort of special concrete catch basin that achieves the same goals as the bioswales in a much smaller space and its use could result in the loss of fewer trees along Bradley Boulevard.

Stormwater Management: Use medians where possible for additional stormwater management.

Additional Items for Preliminary Design: We concur with MCDOT's decision to examine the following items in greater detail during Phase II of this Facility Planning Study and look forward to their resolution at the time of Mandatory Referral:

- Lighting: The adequacy of lighting in the study area should be addressed, particularly at intersections and mid-block crossings.

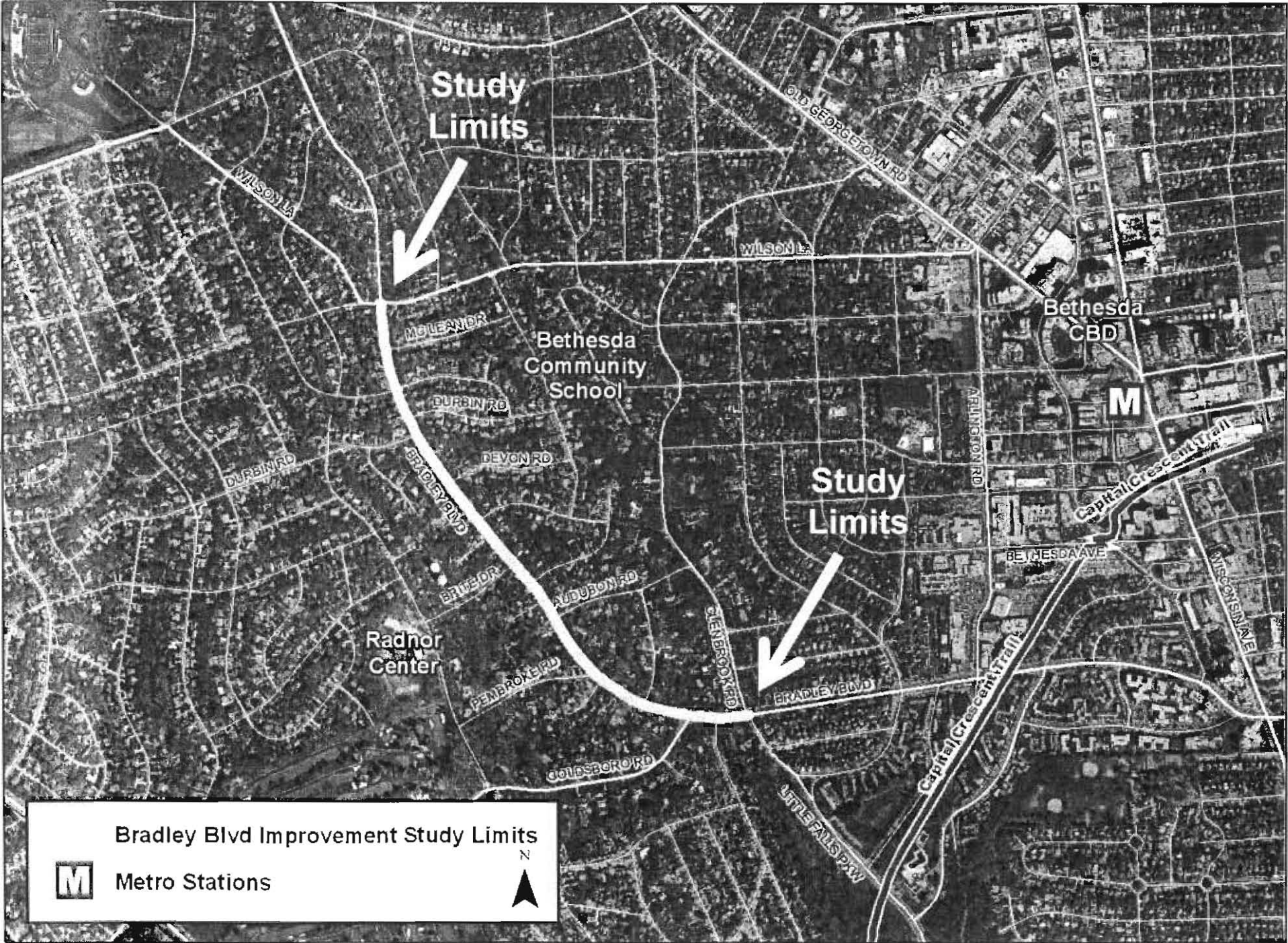
- Setback of shared-use paths at intersections: The shared-use path should cross minor streets closer to Bradley Boulevard, so that motorists turning off of Bradley Boulevard are better able to detect bicyclists. This is particularly important at the intersections with Oldchester Road and Burling Road where the shared use path is set back from the road by over 30 ft to accommodate the proposed stormwater management bioswales.
- Access to bus stops: All bus stops must have ADA-accessible crosswalks in close proximity to provide all transit patrons with safe access.
- Pedestrian crossings at intersections: Legal crosswalks exist at the intersection of all public streets whether or not they are marked. Since ADA requires that all pedestrian facilities be ADA-compatible, every intersection should have handicap ramps wherever a sidewalk or shared use path is proposed, whether or not the crosswalks are marked. This includes unsignalized intersections and three-legged intersections, but the need is particularly great where there are bus stops.
- Additional striped crosswalks: To facilitate safer pedestrian crossings of Bradley Boulevard, additional striped crosswalks may be needed between signalized intersections at Goldsboro Road and Wilson Lane. In addition, striped crosswalks should be provided on the northern and southern legs of the Bradley Boulevard / Glenbrook Road intersection crossing Glenbrook Road and Little Falls Parkway.
- Use of porous pavement for the sidewalks and shared use path: The use of porous pavement for the sidewalks and shared use path would reduce the amount of stormwater runoff requiring treatment. This would in turn reduce the size of drainage swales and the impact on nearby trees.

PUBLIC OUTREACH

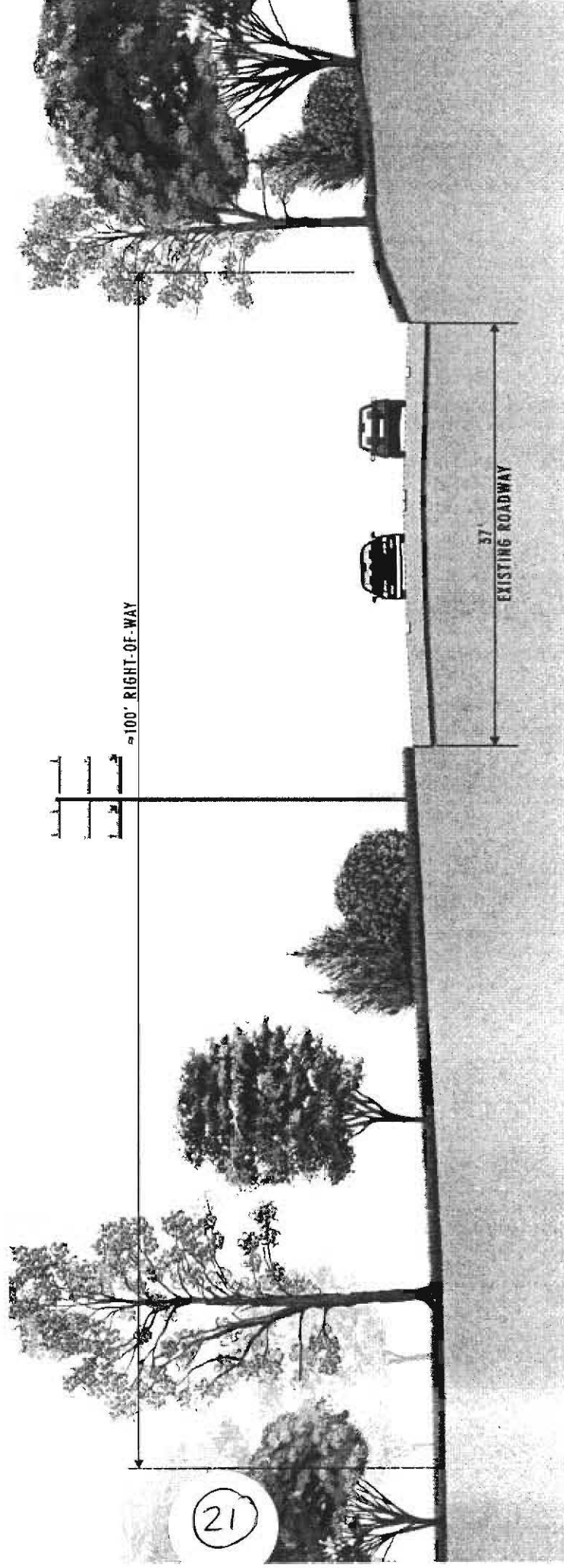
Two public meetings were held for this project on October 27, 2009 and November 10, 2010. The purpose of these meetings was to introduce the project alternatives, process, schedule, and background, and to receive community input and answer questions. The first meeting was attended by approximately 40 citizens and the second meeting was attended by approximately 55 citizens.

During the first comment period after the first public meeting, 158 comments were received, of which two-thirds supported the project and one-third opposed it. During the second comment period after the second public meeting, 86 comments were received, of which three-quarters supported the project and one-quarter opposed it. Most comments did not specify a preferred alternative, but provided comments on elements of the alternatives. Additional comments were received on MCDOT's project blog and in response to project newsletters. The most frequently cited comments are addressed above.

Attachment A: Vicinity Map

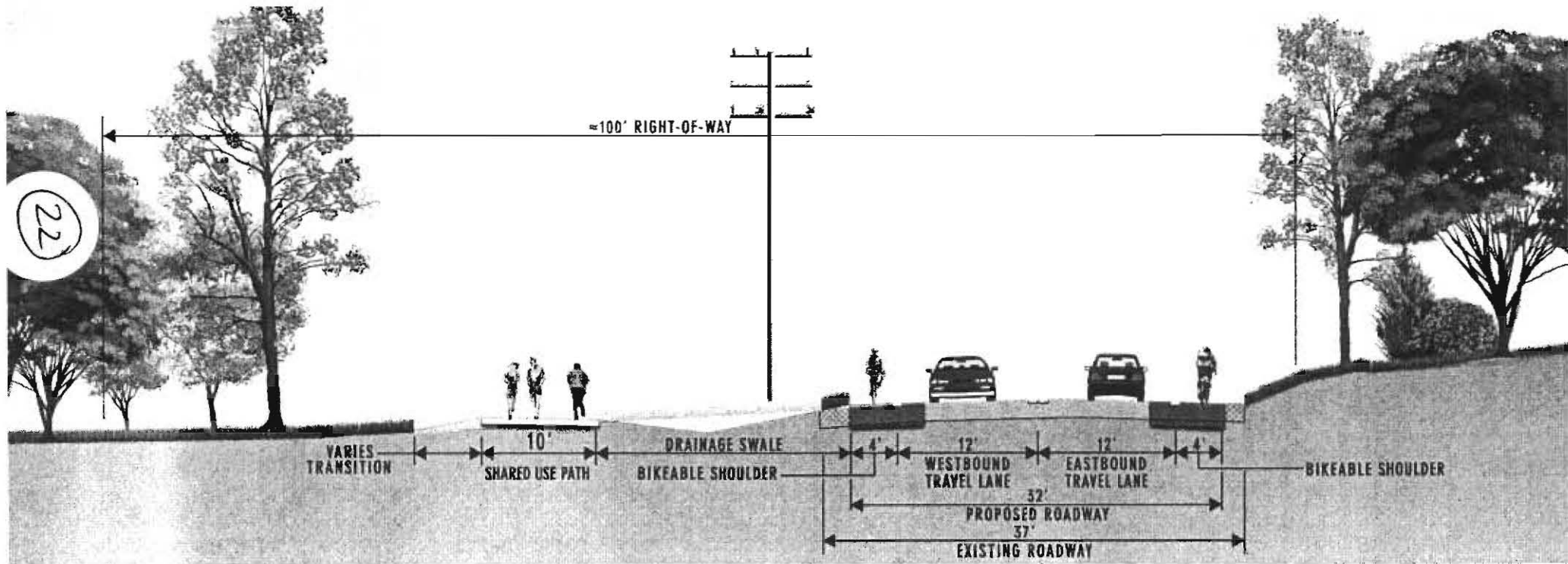


Attachment B-1: Typical Section for Alternative 1



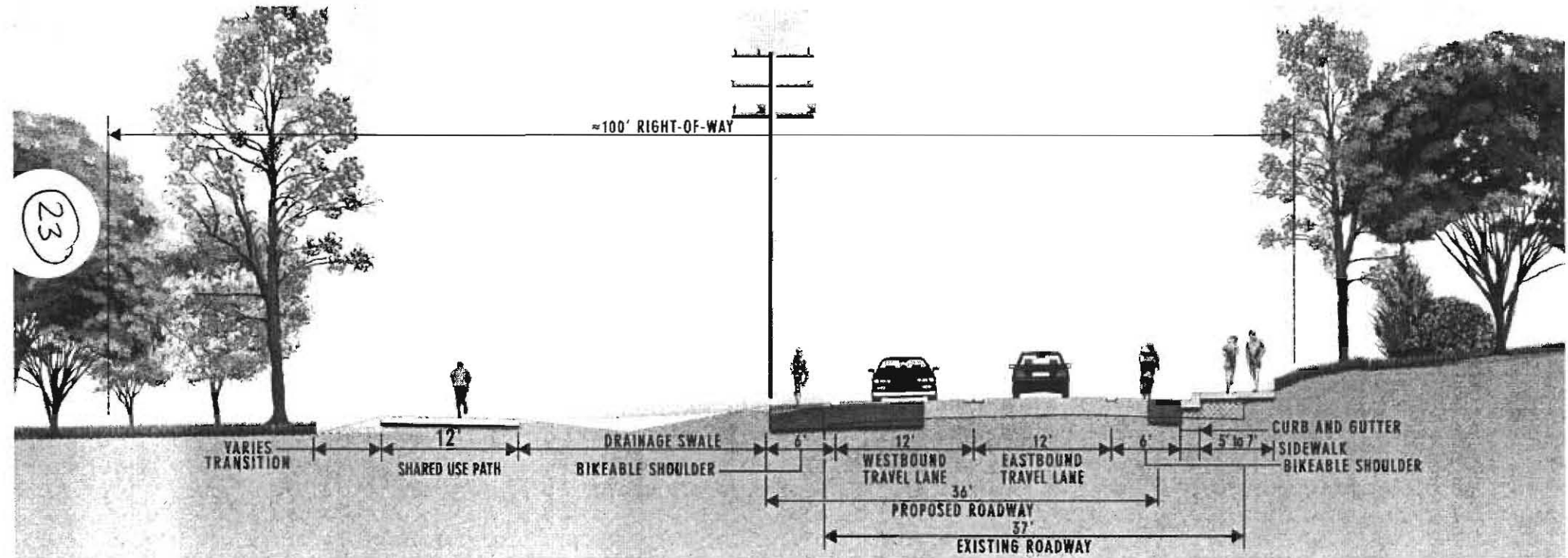
- No changes

Attachment B-2: Typical Section for Alternative 2



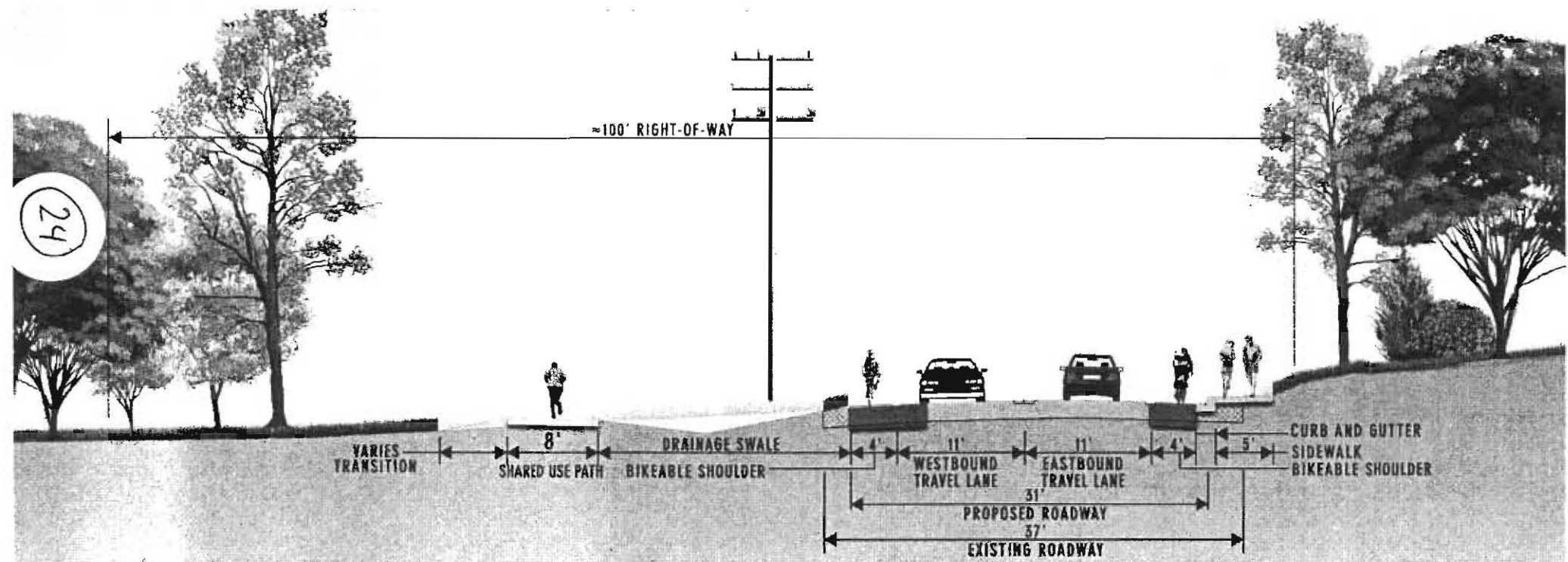
- 10 ft shared use path (north side)
- 4 ft bikeable shoulders

Attachment B-3: Typical Section for Alternative 3



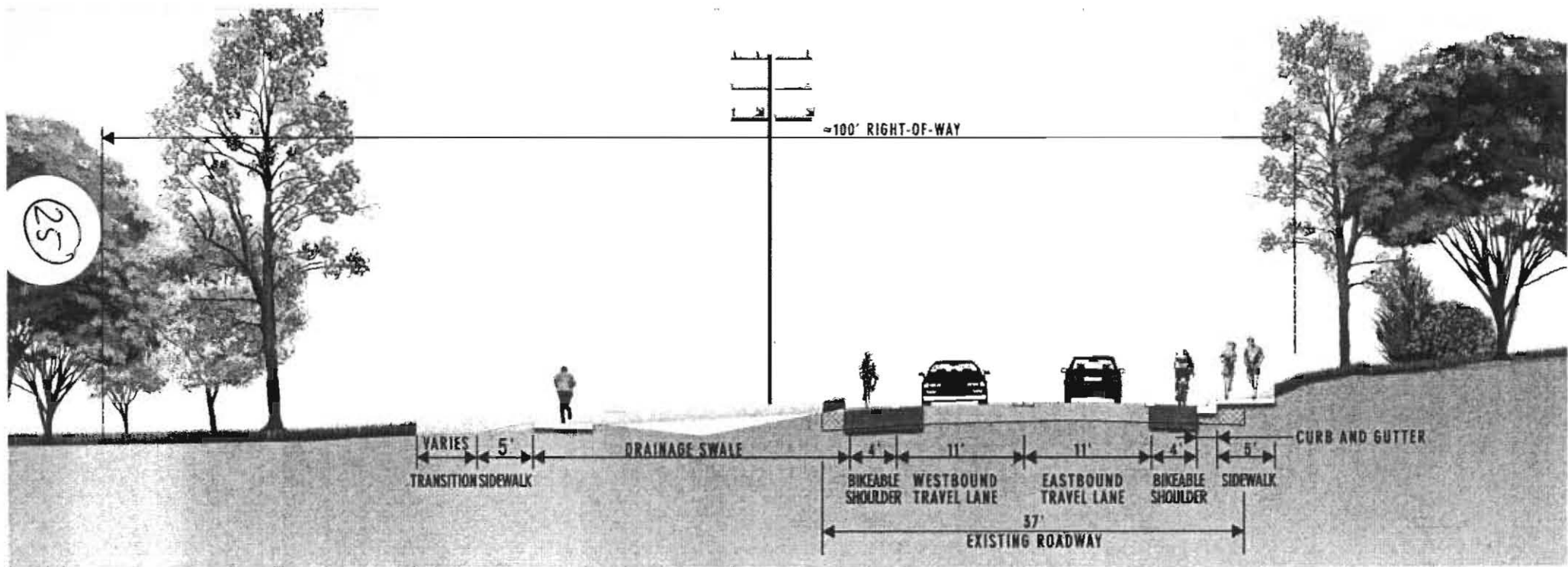
- 12 ft shared use path (north side)
- 6 ft bikeable shoulders
- 5-7 ft sidewalk (south side)

Attachment B-4: Typical Section for Alternative 4A



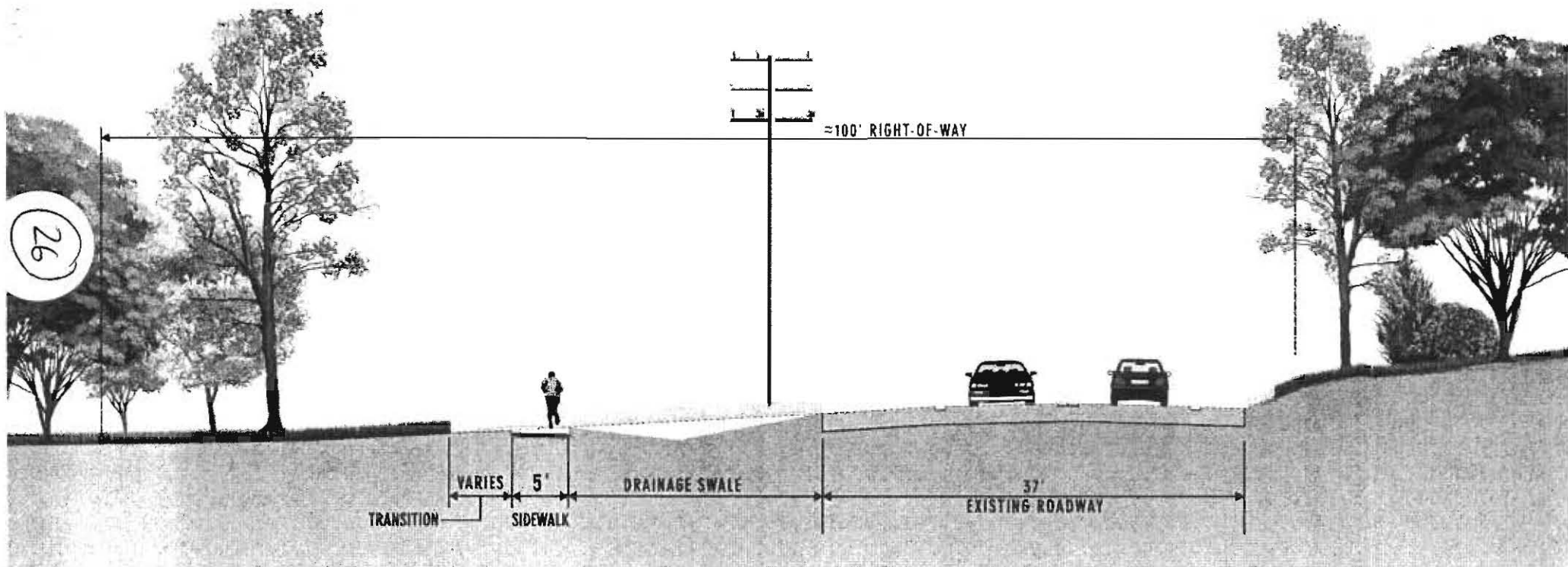
- 8 ft shared use path (north side)
- 4 ft bikeable shoulders
- 5 ft sidewalk (south side)

Attachment B-5: Typical Section for Alternative 4B



- 5 ft sidewalk (north side)
- 4 ft bikeable shoulders
- 5 ft sidewalk (south side)

Attachment B-6: Typical Section for Alternative 4C

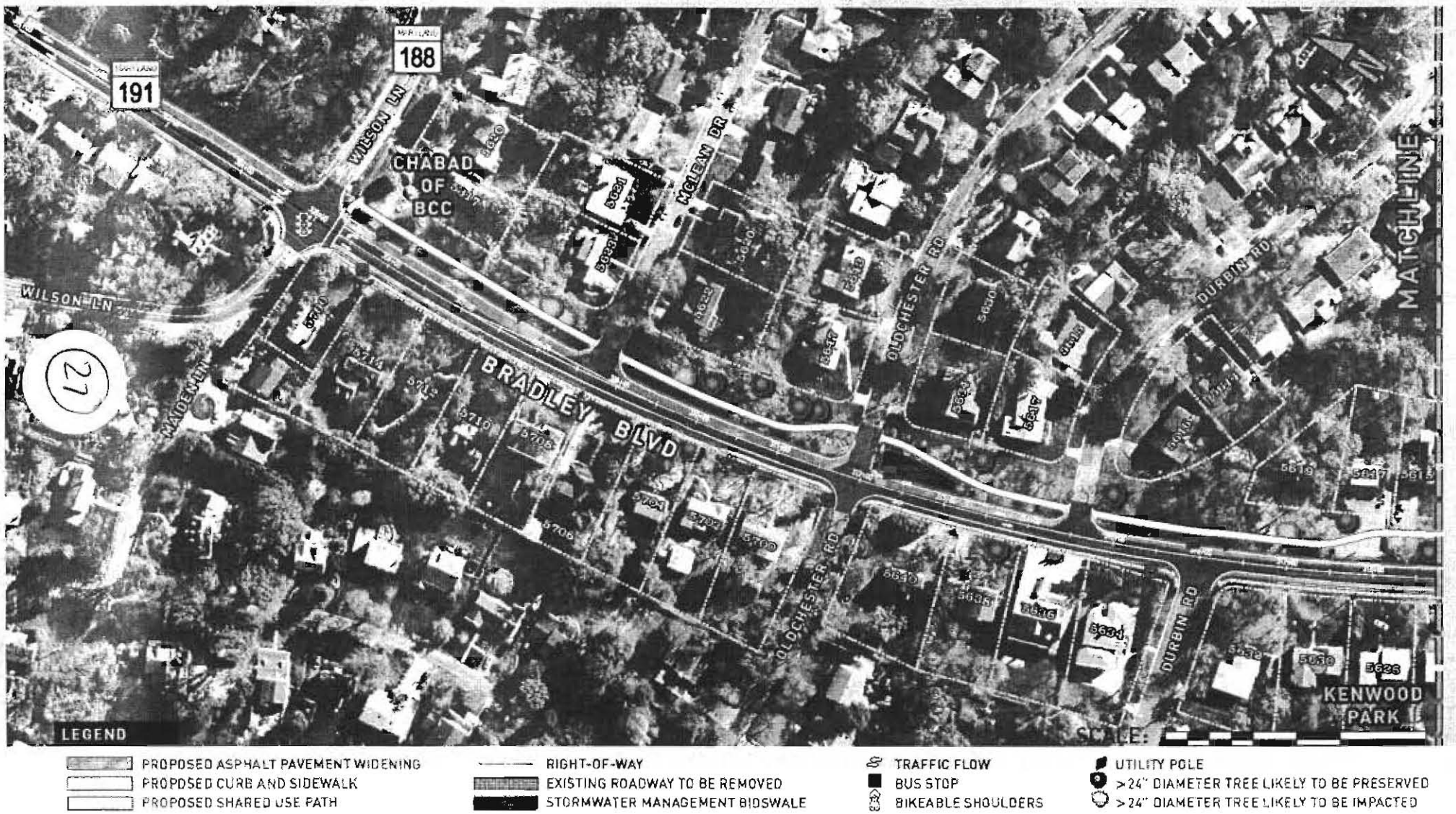


- 5 ft sidewalk (north side)

Attachment C-1: Plan View

BRADLEY BOULEVARD (MD 191) IMPROVEMENTS PROJECT

Figure If-17: Alternate 4A – 8' Shared Use Path North Side and Sidewalk South Side with Bikeable Shoulders (RECOMMENDED ALTERNATE)



BRADLEY BOULEVARD (MD 191) IMPROVEMENTS PROJECT

LEGEND

- PROPOSED ASPHALT PAVEMENT WIDENING
- PROPOSED CURB AND SIDEWALK
- PROPOSED SHARED USE PATH
- RIGHT-OF-WAY
- EXISTING ROADWAY TO BE REMOVED
- STORMWATER MANAGEMENT BIOSWALE
- TRAFFIC FLOW
- BUS STOP
- BIKEABLE SHOULDERS
- UTILITY POLE
- > 24" DIAMETER TREE LIKELY TO BE PRESERVED
- > 24" DIAMETER TREE LIKELY TO BE IMPACTED

Attachment C-3: Plan View

BRADLEY BOULEVARD (MD 191) IMPROVEMENTS PROJECT

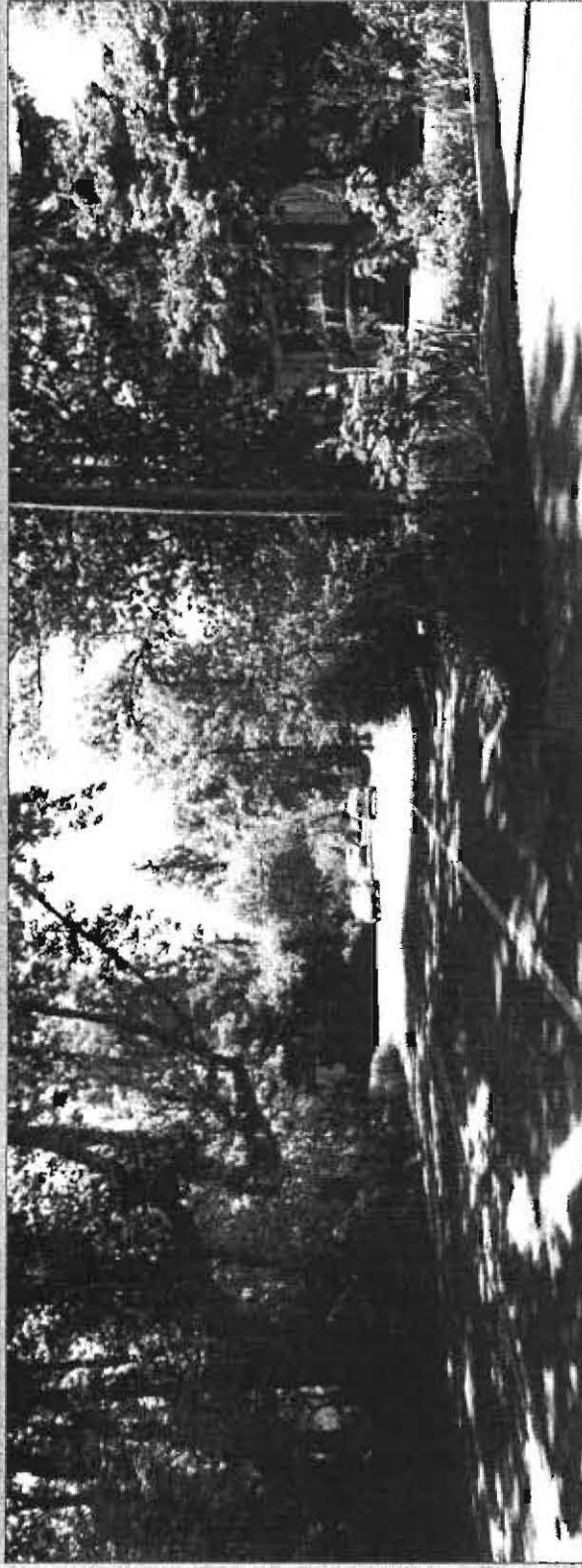
Figure II-19: Alternate 4A – 8' Shared Use Path North Side and Sidewalk South Side with Bikeable Shoulders **(RECOMMENDED ALTERNATE)**



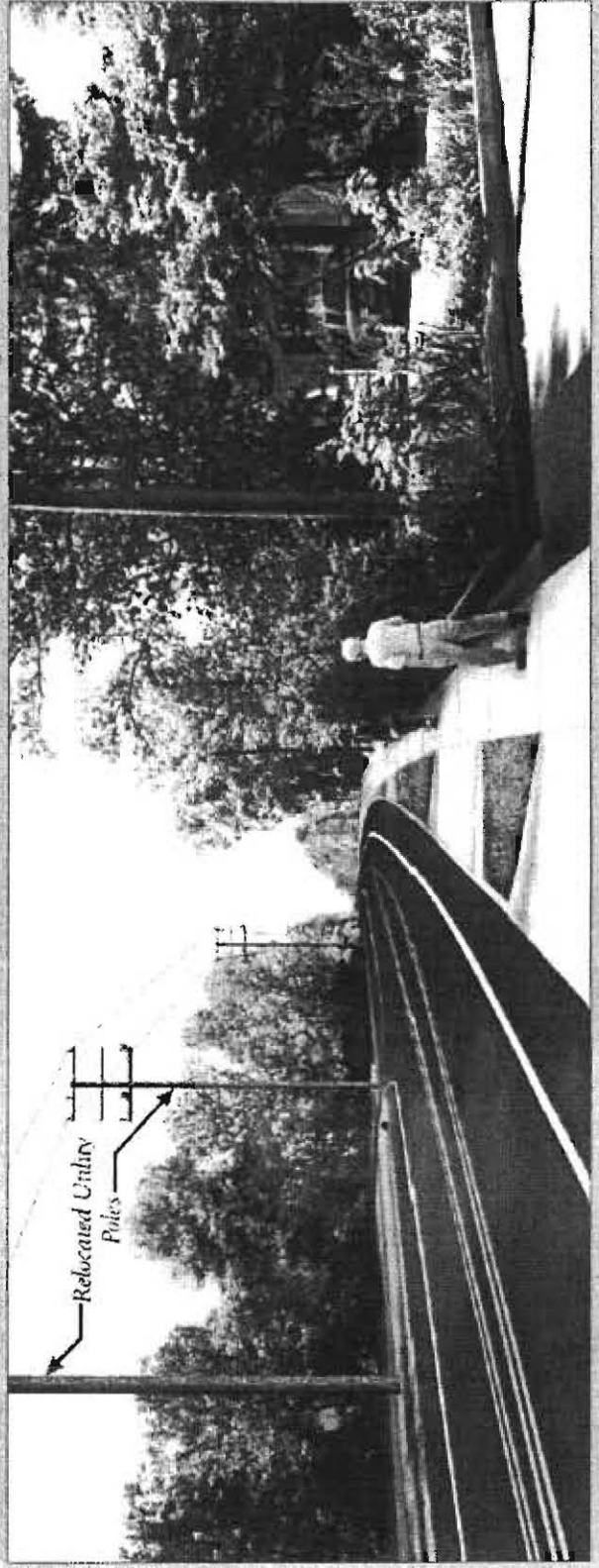
Attachment D: Rendering

BRADLEY BOULEVARD
LOOKING EAST FROM WILSON LANE

EXISTING



PROPOSED ALTERNATE 4A



These are Artistic Renderings, may not represent Final Design

GENERAL REQUIREMENTS FOR BIKEWAY FACILITIES

1. All projects shall evaluate opportunities to improve bicycle accommodations on the roadway.
2. No project shall reduce an existing shoulder to less than 4 feet on roadways where bicycles are permitted.
3. No project or action shall reduce existing bicycle accommodations without an approved design waiver. In no case, shall an existing bikeway be reduced below the minimum requirements.
4. By Maryland state law, bicyclists are prohibited from operation on any roadway (travel lane) where the posted maximum speed limit is 55 MPH or higher.
5. Minimum lane widths shall be 10 feet for travel lanes and 9 feet for turn lanes and may be increased for higher speeds and truck volumes. The lane widths must be consistent with the adjacent lane widths upstream and downstream of the bicycle improvement project limits. The lane widths shall not be less than the minimum allowed and must be acceptable to the Assistant District Engineer for Traffic.
6. If rumble strips exist along a shoulder, a minimum clear path of 4 feet is required from the rumble strip to the outside edge of the paved shoulder. As set forth in the draft *Guidelines for Application of Rumble Strips and Rumble Stripes*, January 2011, there shall be appropriate gaps in rumble strips along roadways that allow the presence of bicycles and the posted speed is less than 55 MPH.
7. If inlet grates are present within the project limits, they must be replaced with reticular-type inlet grates as part of the project scope.
8. Refer to the Design Supplement to this Policy for specific design guidelines for bicycle facilities.

MARKED BICYCLE LANES

Where the following criteria are met, the shoulder shall be marked and signed as a designated bicycle lane. The criteria include:

1. SHA shall mark the facility as a bicycle lane where there is continuous minimum shoulder width as stated below for at least 2,500 feet. In instances where the bikeway connects key destinations, existing trails, recreational facilities or traverses conflict points such as intersections, a bike lane of less than 2,500 feet may be acceptable.
2. A marked bicycle lane shall not be less than 4 feet, excluding the gutter pan. Bicycle lanes operating adjacent to guardrail or concrete barrier/curb without a gutter pan, shall not be less than 5 feet.
3. All projects that involve widening or new construction shall meet the preferred widths in Figure 1.1 for marking Bicycle Lanes.

Figure 1.1

PREFERRED SHOULDER WIDTHS FOR MARKED BICYCLE LANES		
POSTED SPEED LIMIT	TRUCK VOLUMES (%ADT)	SHOULDER/LANE WIDTH*
≤ 35 MPH	-----	4 FEET ⁺
> 35 MPH and ≤ 45 MPH	≤ 8% trucks	4 FEET ⁺
	> 8% trucks	6 FEET
> 45 MPH	-----	6 FEET

* The Shoulder/Lane Width is measured to the edge of the gutter pan.

+ Add 1 foot to Shoulder/Lane Widths if operating adjacent to guardrail, concrete barrier, or a curb without a gutter pan.

Notes:

1. If parking lanes exist along the roadway, a minimum 5 foot shoulder/bicycle lane is required between the through lane and parking lane.

Shared Use Path - General Design Characteristics

- 8-12' concrete or asphalt path
- Located with the right-of-way (ROW) of a road or transitway
- Designed and constructed by, or under the supervision of, a transportation agency (SHA, MTA, DPWT) or municipal agency (Rockville or Gaithersburg)
- May be maintained and/or managed by DPWT or M-NCPPC
- Intended for off-road non-motorized transportation (biking and walking), but may be used for recreation (joggers, roller-bladers, etc.)
- Prohibit motorized vehicles (exceptions include electric wheelchairs and Segways)
- Should be designed and constructed to AASHTO and MUTCD standards, including appropriate informational, warning and regulatory signs.

Examples of shared use paths in the County include: Falls Road, Greencastle Road, Robey Road, Great Seneca Highway, North Bethesda Trail, Norbeck Road extended.

Shared use paths should not be confused with sidewalks. Sidewalks are designed and intended for pedestrian travel and can be as narrow as 4' depending on the road classification. Sidewalks often include street furniture (benches, bus shelters, trash receptacles) and other characteristics that are intended to only enhance the pedestrian experience, and serve as dangerous obstacles to bicyclists.

Shared Use Path - Other Design Considerations

Pavement Width and Clearance Zones

AASHTO recommends a pavement width of at least 10 feet, but the County road standards currently recommend eight feet. This discrepancy needs to be reconciled. The 10-foot standard allows two bicyclists to pass each other with a one- or two-foot buffer and minimizes the need to leave the path. Ten feet is recommended by this plan and twelve feet is recommended for areas expecting intensive use. Widths less than 10 feet may be acceptable where right-of-way is limited or for locations with severe site constraints. These decisions can be made during project planning or during subdivision review.



Figure 3-4. Shared use path along a major road or highway

(Source: www.pedbikemages.org/Dan Burden)

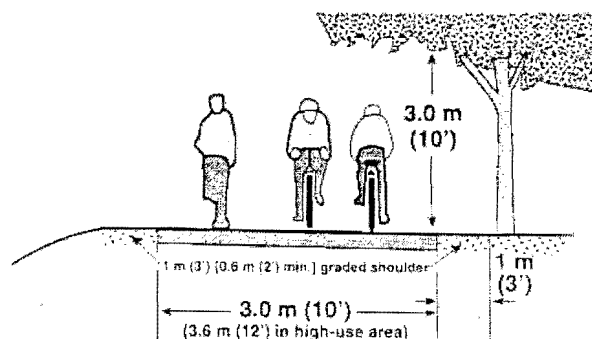


Figure 3-5. Cross section of a typical shared use path (Source: Oregon Department of Transportation)